

ON THE TAXONOMY OF *HELICOBIA AUSTRALIS* (SARCOPHAGINAE),
A DIPTEROUS INSECT ASSOCIATED WITH GRASSHOPPERS.

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(Two Text-figures.)

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The genus *Helicobia* was erected by Coquillett (1895) to receive one species of *Sarcophaga*, *S. helicis* Townsend from North America, which has a bristly radius (first vein).

The diagnosis was as follows: "First and third veins bristly, the others bare, apical cell open, ending at three-fifths of the distance from second vein to the wing tip; bend of fourth vein rectangular and bearing a long appendage*; hind cross vein much less oblique than the apical, terminating at last third of distance between the small and the bend, its posterior end much nearer the wing-margin than to the small cross vein. Head at the vibrissae nearly as long as at insertion of the antennae, its lower margin convex; frontal bristles descending to middle of second antennal joint; sides of face each bearing a row of short macrochaetae; antennae three-fourths as long as the face, the third joint twice as long as the second; arista long, plumose on the basal three-fifths, the remainder bare; vibrissae inserted slightly above the oral margin, a few short bristles above each; cheeks as broad as the eye-height, the eyes bare. Abdomen oval, consisting of four segments, densely grey pollinose. Type: *Sarcophaga helicis* Townsend (*Psyche*, February, 1892, pp. 220-21)."

Except for the bristly R₁, all the characters enumerated in this diagnosis are too general and can hardly be taken as having any generic value.

There appear to be no further comments on this genus and no addition of species to it for about forty years; only it was recognized that the genotype *H. helicis* Towns. is a synonym of *S. rapax* Wlk.

In their work on Australian Sarcophagidae, Johnston and Tiegs (1921) described *H. australis*, but did not otherwise comment on the genus. As they had been in communication with Dr. Aldrich over their work, it is probable that the latter had pointed out to them the generic status of the fly.

Enderlein (1928) considers *Helicobia* as a synonym of *Bercea* R.-D.; but the genotype of the latter is *B. penicillata* Vill. = *haemorrhoidalis* (Fall.) R.-D. nec Fall. Hardy (1936) does not accept this generic synonymy because he thought that the genotype of *Bercea* was *S. haemorrhoidalis* Fall. However, it seems that Townsend also does not consider *Bercea* as a valid synonym; apparently he has made out that *Helicobia rapax* (Walk.) is devoid of ctenidium on the mid femora in the male and is also not so closely related to *Asceltoctis* Enderlein, which this author thought might fall into synonymy with *Helicobia*, in case the genotype of this genus turned out to be devoid of the mid femoral ctenidium.

* This is probably only a fold.

In 1932 Hardy expressed his opinion on *Helicobia* in the following manner: "This generic name is a synonym of *Sarcophaga* as accepted by most authors, and I have been unable to associate the typical form with the Australian species placed under the name, although the two species have some characters in common. I retain the name *Helicobia* as being one of convenience, rather than propose a generic name at the present time because there is no unanimous opinion with regard to the limits of the associated genera." Further, he considers the presence of only three post-sutural dorsocentral bristles as typical of *Helicobia*.

In 1934 Curran (1934a) described *H. guianica* without discussing the genus, and in the same year (1934b) he described three further species from South Africa: *H. alerta*, *H. selene* and *H. monroi*. He mentions there that "the bristly R_1 is not always a generic character* in this group but that in this case it separates a fairly large group of species from the unwieldy genus *Sarcophaga* and that its use undoubtedly simplifies the identification of the species of this group".

In 1935 Townsend gave an extensive key to all the genera of the Sarcophaginae but his survey does not include a detailed study of each genus. The characters he attributes to *Helicobia* in his key can be summed up as follows:

Male.	Female.
No facio-orbital bristles.	No facio-orbital bristles.
Outer vertical not developed.	Arista plumose half-way.
Frons not produced.	Two reclinate fronto-orbitals.
At least one bristle below the anterior point of frontalia.	Frontal bristles diverging, at least one bristle below the anterior point of frontalia.
Prosternum bare.	Two proclinate fronto-orbital and at least one reclinate fronto-orbital.
Three strong post sutural.	R_1 bristled to half-way.
R_1 bristled on one-third to half-way.	
Claws short.	
Tibiae not villous.	

The Australian species that Johnston and Tiegs refer to *Helicobia* differ from the above in the following way:

Male.	Female.
The facio-orbital bristles are represented by 2-5 stiff hairs.	These hairs are weaker than in the male but a few are also of a bristly nature.
Prosternum bristly.	Arista plumose to three-fifths of the way.
	Only one posterior reclinate orbital and 2 anterior proclinate.
	Frontal bristle scarcely diverging.

As it seems inadvisable to increase the number of genera of the Calliphorinae with bristly radius, *H. australis* J. & T. can reasonably be placed in *Helicobia* in spite of the discrepancies mentioned above; it could almost be placed in *Helicobiopsis* Towns., which has a bristled prosternum but is defined also by one strong facio-orbital and long claws which *H. australis* does not possess.

HELICOBIA AUSTRALIS J. & T.

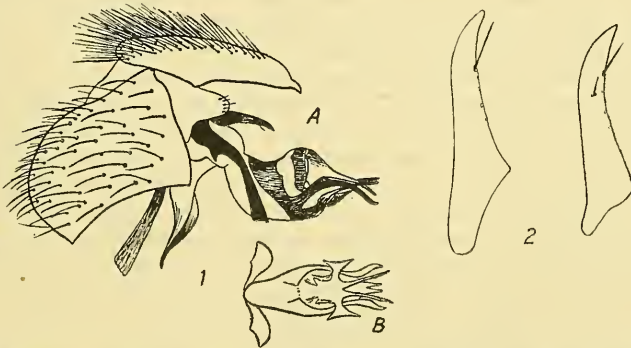
Proc. Roy. Soc. Qld., xxxiii, 1922, p. 50 and fig. 24, p. 75.

Thanks to the kindness of Mr. Longman, Director of the Queensland Museum, I was allowed to study the two male specimens from which the authors described this species.

Their description is quite accurate, but a few emendations are necessary. They may have studied the coloration of the specimens under artificial light so that it appeared on the whole too pale; thus the mesofacial plate is not pale fawn but greyish pruinose, darker than the parafacials, its ground colour more or less

* Twenty-four genera of the Sarcophaginae, 11 of Townsend, 8 of Enderlein, 1 of Aldrich, 3 of R.-Desvoidy and 1 of Coquillett, present this character of a bristly R_1 .

testaceous. The second antennal segment has no silvery bloom, the third, which is only about twice as long as the second (7:4), is not silvery but greyish-brown. There are six frontal bristles on one side and 7 on the other, not 8 on both sides (this number varies from 6 to 9); it is possible that the upper vertical was counted in the row, but it can easily be distinguished from the others because it is reclinate. When the thorax is viewed from the front, the black markings of the notum appear very shiny; the lateral black vittae do not extend on the scutellum but its corners are narrowly black. The median dark vitta extends on the disc of the scutellum but does not reach its tip. There are no distinct anterior acrostichals, no post-humeral (the two mentioned by Johnston and Tieggs must be the anterior presupraalar and preintraalar)*, there are three intraalar (posterior) and not two. The chaetotaxy of the thorax is therefore as follows: 1 pair of prescutellar acrostichal, 2 predorsocentral, 3 postdorsocentral, 1 preintraalar, 3 postintraalar, 3 humeral, 2 presupraalar, 3 postsupraalar, 2 to 4 notopleural, 2 postalar, 2 lateral scutellar, 1 pair apical scutellar cruciate, and one pair discal scutellar bristles.



Text-figs. 1-2.—*Helicobia australis*. 1A, Male hypopygium, $\times 33$; 1B, Phallus, ventral view, $\times 33$; 2, Posterior claspers, $\times 100$.

The hypopygium of the holotype has been figured by Johnston and Tieggs (fig. 24), but as it had not been treated with potash the phallus was not extended and the figure does not give an exact idea of its complicated structure. This organ was removed by me from the holotype and treated with potash and was then drawn by means of the camera lucida in liquid medium so that no pressure was exerted upon it (see fig. 1A). The posterior clasper carries only one bristle, there is no trace whatsoever of a second one or of a pore where a second one might have been inserted. The posterior claspers of at least half-a-dozen other specimens have been examined and in only one of them was there a second very small lateral bristle found on one of the claspers only (fig. 2). I am quite satisfied that this species lacks the second bristle of the posterior claspers which Hardy considers as a special character of *Helicobia* and of a group of species of *Sarcophaga*. The complicated phallus is characterized by four pairs of projections as can be seen in the ventral view of that organ (fig. 1B); the two long and thin ventral ones being serrated on their internal edge. The hypopygium of *Helicobia monroi* Curran from South Africa, which I have studied, has a similar phallus; the homologous ventral projections have also a serrated edge. In this species the posterior clasper also carries only a single bristle.

* Terminology of Townsend.

The holotype and the paratype are rather teneral and undersized; they were bred specimens and may have been underfed and killed too soon after emergence. All specimens obtained by me under natural conditions are about 7 mm. long instead of 5 and their bristles are much stronger.

As the female has not yet been described I give here the description of a specimen which I have chosen as the allotype. It is deposited in the collection of the Division of Economic Entomology at Canberra.

Head: frons wide, somewhat more than one-third of the head-width (15:19); parafrontalia darkish testaceous pruinose above, paler below, the parafacials almost silvery in certain light; interfrontalia velvety blackish-brown; antennae dark brown, the third segment very slightly pruinose, palpi and proboscis dark brown; mesofacial plate and peristome slightly testaceous. Second antennal segment not as long as the third (6:10), arista plumosity equal on both sides, arista thick on its basal quarter, very thin distally. Chaetotaxy: 7 frontal bristles on each side, 3 orbital, the two anterior ones proclinate, the last one reclinate, 2 proclinate ocellar (plus a pair of very thin hair-like bristles curved outwards), internal and external verticals present, one pair of small postocellar bristles. About four small bristles on the parafacials along the eye-margin, vibrissae long and cruciate, three small bristles above them on facial ridge. Eyes bare.

Thorax dull, slightly testaceous grey, with three almost mat dark lines, the median one extending distinctly on the scutellum, the disc of which is therefore all black and the sides grey. On the sides, the meso-pleurae are more distinctly testaceous grey than the rest. Chaetotaxy: no distinct anterior acrostichal, only one pair of them antescutellar and small, 5 large dorsocentral and a small anterior one, 3 humeral, 1 large preintraalar, 3 postalar, 2 lateral scutellar, 2 discal (almost preapical) scutellar, one propleural, one mesopleural spiracular, 6 mesopleural, 3 sternopleural in line and 3 pteropleural bristles. *Wings* as in most Sarcophaginae, but R_1 bristled, cell 5r open, ending well before the wing tip, no M_2 stump, m wavy, $r-m$ oblique, one costal spine. *Legs* as in male, no ciliae on hind tibiae. *Abdomen* moderately shining, marmorated with dull grey, chaetotaxy as in male, that is: one lateral marginal on segments II and III, 3 lateral on segment IV and one pair of dorsal marginal, 6 large marginal on segment V.

Length, 7 mm., wing 5.5 mm. (smallest female 5 mm.).

Black Mountain, Canberra, F.C.T., mid March, 1936, bred in cages containing *Austroicetes pusilla* from local origin.

Among the numerous other females of the same lot were some specimens with only 6 frontal bristles and one with a single apical scutellar bristle.

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